

## CLAIMS

1       1. A system comprising:  
2       a simulator including:  
3       a virtual-failure event selector providing for selecting a virtual-  
4 failure event corresponding to a real-failure event that applies to a  
5 real computer cluster, and  
6       a virtual-cluster generator for generating a first virtual cluster in  
7 a virtual pre-failure configuration corresponding to a real pre-failure  
8 configuration of said real computer cluster, and, in response to  
9 selection of said virtual-failure event, for generating a second virtual  
10 cluster in a virtual post-failure configuration corresponding to a real  
11 post-failure configuration of said real computer cluster.

1       2. A system as recited in Claim 1 wherein, in said real pre-failure  
2 configuration, said real computer cluster runs a software  
3 application AC on a first computer of said real computer cluster and  
4 not on a second computer of said real computer cluster, and  
5 wherein, in said real post-failure configuration, said real computer  
6 cluster runs said application on said second computer but not on  
7 said first computer.

1       3. A system as recited in Claim 1 further comprising said real  
2 computer cluster, said real computer cluster including profiling  
3 software for providing a descriptive profile of said real computer  
4 cluster, said virtual-cluster generator generating said virtual cluster  
5 in said pre-failure configuration using said descriptive profile.

1       4. A system as recited in Claim 3 wherein said real computer  
2 cluster is connected to said simulator for providing said descriptive  
3 profile thereto.

1       5. A system as recited in Claim 2 wherein said simulator further  
2 includes an evaluator for evaluating said virtual cluster in its post-  
3 failure configuration.

1       6. A system as recited in Claim 5 wherein said simulator further  
2 includes a test sequencer, said test sequencer selecting different  
3 virtual-failure events to be applied to said first virtual cluster in said  
4 pre-failure configuration so as to result in different post-failure  
5 configurations of said virtual cluster.

1       7. A system as recited in Claim 6 wherein said simulator further  
2 includes a statistical analyzer for statistically analyzing evaluations  
3 of said different post-failure configurations of said virtual cluster.

1       8. A system as recited in Claim 7 wherein said test sequencer  
2 automatically tests different pre-failure configurations of said  
3 virtual cluster against different failure events, said statistical  
4 analyzer providing a determination of optimum pre-failure  
5 configuration by statistically analyzing evaluations of the resulting  
6 post-failure configurations.

1       9. A system as recited in Claim 8 wherein said simulator is  
2 connected to said real computer cluster for providing said  
3 determination thereto, said real computer cluster automatically  
4 reconfiguring itself as a function of said determination.

1        10. A method comprising:

2        a) generating a first virtual computer cluster in a virtual pre-  
3 failure configuration that can serve as a model for a real computer  
4 cluster in a pre-failure configuration that responds to  
5 predetermined types of failures by reconfiguring to a real post-  
6 failure configuration, said reconfiguring including migrating a real  
7 application on one real computer of said real computer cluster to  
8 another real computer of said real computer cluster;

9        b) selecting a sequence of at least one of said predetermined  
10 types of failures; and

11        c) generating a second virtual computer cluster in a virtual post-  
12 failure configuration that can serve as a model for said real  
13 computer cluster in said real post--failure configuration.

1        11. A method as recited in Claim 10 wherein steps a, b, and c are  
2 iterated for different configurations of said real computer cluster  
3 and for different sets of said predetermined failure types, said  
4 method further comprising providing a recommended configuration  
5 for said real computer cluster.

1        12. A method as recited in Claim 10 further comprising:

2        gathering profile information about said real cluster in said first  
3 configuration, wherein said first virtual computer cluster is  
4 generated using said profile information.

1        13. A method as recited in Claim 12 wherein steps a, b, and c are  
2 iterated for different configurations of said real computer cluster  
3 and for different sets of said predetermined failure types, said  
4 method further comprising providing a recommended configuration  
5 for said real computer cluster.

1        14. A method as recited in Claim 13 further comprising:  
2        transmitting said recommendation to said real computer cluster;  
3        and  
4        implementing said recommended configuration on said real  
5        computer cluster.